

# Claims

- [c1] A system for thermal dissipation from a heat producing electronic device comprising:
- a substrate for fabricating integrated circuits, said substrate having a first face and a second face, said second face being disposed substantially parallel to said first face;
  - an electronic device disposed in said first face;
  - a crack stop disposed in said first face surrounding said electronic device, said crack stop being metallized; and
  - a plurality of first metal conduits extending through said substrate from said second face thereof to said crack stop, wherein each first metal conduit is in thermal contact with said crack stop.
- [c2] The system of claim 1 wherein said crack stop is continuous.
- [c3] The system of claim 1 wherein a portion of said substrate from said second face extending toward and substantially aligned with said electronic device is configured for removal and disposing a planar heat sink therein proximately facing a backside defining said electronic device.

[c4] The system of claim 3 wherein said planar heat sink is a metallized layer configured to dissipate heat from said backside defining said electronic device.

[c5] The system of claim 1 further comprising:  
a plurality of second metal conduits, wherein each second metal conduit of said plurality of second metal conduits extends through said substrate from said second face thereof toward said electronic device but short thereof.

[c6] The system of claim 1 wherein said each second metal conduit extends to a doped layer disposed in said substrate between said electronic device and said second face, said doped layer configured to control extension of said each second metal conduit toward said electronic device during fabrication.

[c7] The system of claim 5 wherein said plurality of second metal conduits is positioned to be substantially equidistant from each other conduit of said plurality of second metal conduits.

[c8] The system of claim 7 wherein a pattern formed by said plurality of second metal conduits is variable over an area of said substrate.

- [c9] The system of claim 1 wherein each conduit of said plurality of first and second metal conduits is fabricated from copper.
- [c10] The system of claim 1 wherein each conduit of at least one of said plurality of first and second metal conduits is a metal annular conduit.
- [c11] The system of claim 1 wherein each said metal annular conduit defines a cylinder surrounding one of air and said substrate.
- [c12] The system of claim 1 wherein said crack stop is configured to extend past the BEOL to the FEOL of said electronic device disposed in said substrate.
- [c13] The system of claim 1 wherein said substrate is a carrier module and said electronic device includes at least one chip disposed on said carrier module.
- [c14] A method for thermal dissipation from a heat producing electronic device comprising:
  - configuring a substrate having a first face and a second face, said second face being disposed substantially parallel to said first face;
  - disposing an electronic device in said first face;
  - etching a continuous crack stop in said first face surrounding said electronic device;

metallizing said crack stop; and  
disposing a plurality of first metal conduits extending through said substrate from said second face thereof to said crack stop, wherein each first metal conduit is in thermal contact with said crack stop.

[c15] The method of claim 14 further comprising:  
removing a portion of said substrate from said second face extending toward and substantially aligned with said electronic device; and  
disposing a planar heat sink formed thereby proximately facing a backside defining said electronic device.

[c16] The method of claim 14 further comprising:  
disposing a plurality of second metal conduits, wherein each second metal conduit of said plurality of second metal conduits extends through said substrate from said second face thereof toward said electronic device but short thereof.

[c17] The method of claim 14 wherein said each second metal conduit extends to a doped layer disposed in said substrate between said electronic device and said second face, said doped layer configured to control extension of said each second metal conduit toward said electronic device during fabrication.

- [c18] The method of claim 14 wherein each conduit of said plurality of first and second metal conduits is fabricated from copper.
- [c19] The method of claim 14 wherein each conduit of at least one of said plurality of first and second metal conduits is a metal annular conduit, each said metal annular conduit defining a cylinder surrounding one of air and said substrate.
- [c20] The system of claim 14 further comprising:  
configuring said crack stop to extend past a backside of said electronic device disposed in said substrate.